AMENDMENTS TO THE SPECIFICATION

Applicant presents replacement paragraphs below indicating the changes with insertions indicated by underlining and deletions indicated by strikeouts and/or double bracketing.

Please amend paragraph number [3] as shown below.

[3]   To facilitate network operation management, different kinds of authentication modes for access subscribers are widely used in networks. Presently, in networks that provide access service through ADSL (Asymmetric Digital Subscriber Line), VDSL (Very High Bit Rate Digital Subscriber Line), FE (Fast Ethernet), or G.shdsl (Single-Pair High-Speed Digital Subscriber Line), usually PPPoE (Point to Point Protocol over Ethernet), 802.1x, Web (World Wide Web) authentication, and DHCP + (DHCP: Dynamic Host Configuration Protocol) authentication modes, etc., are used. In those authentication modes, authentication request messages sent from subscriber ends are processed by an access server, which obtains subscriber identity and location information, i.e., the access server also obtain subscriber location information besides obtaining subscriber account and password information for identity authentication from the request messages through authentication messages based on the above authentication protocols, so as to implement extended service features when performing local and Radius (remote) authentication and accounting according to the subscriber location information; said location information comprises port number and slot number of the network access device where the subscriber accesses; said extended service features comprise: restricting the subscriber related to a specific account to access the network via only one single subscriber access port through binding subscriber account and location information, providing the subscriber with a private line access network; providing a function of tracking down to a physical port according to the subscriber location information. Therefore, the subscriber location information hereinafter refers to line identification and characterization of the subscriber.

Please amend paragraph number [14] as shown below.

[14]   the network access device converting the accessed subscriber location information into a code in the encoding format of the corresponding field in a ~~message~~ packet to be sent outwards by the subscriber;

Please amend paragraph number [15] as shown below.

[15]   the network access device receiving a packet~~message~~ sent from the subscriber, replacing the corresponding field in the packet~~message~~ with the determined subscriber location information code, and transferring the packet~~message~~ in the network communication system.

Please amend paragraph number [18] as shown below.

[18]   Said step of converting the accessed subscriber location information into a code in the encoding format of the corresponding field in the packet~~message~~ to be sent outwards by the subscriber comprises:

Please amend paragraph number [19] as shown below.

[19]   the network access device converting the accessed subscriber location information into a code in the same encoding format as the MAC address carried in the packet~~message~~ to be sent outwards by the subscriber.

Please amend paragraph number [20] as shown below.

[20]   Said step of the network access device receiving the packet~~message~~ sent from the subscriber, replacing the corresponding field in the packet~~message~~ with the determined

subscriber location information code, and transferring the packet~~message~~ in the network

communication system comprises:

Please amend paragraph number [21] as shown below.

[21]   the network access device receiving the packet~~message~~ sent from the

subscriber;

Please amend paragraph number [22] as shown below.

[22]   the network access device replacing the source MAC address information

carried in the packet~~message~~ sent from the subscriber with the determined subscriber

location information code, and sending the packet~~message~~ to the access server.

Please amend paragraph number [26] as shown below.

[26]   configuring a correspondence between the ~~physical~~ subscriber location

information and the subscriber location information code in the broadband access device;

Please amend paragraph number [27] as shown below.

[27]   configuring a correspondence between the ~~physical~~ subscriber location

information code and the subscriber location information in the broadband access server, or

configuring a correspondence between the ~~physical~~ subscriber location information code and

the subscriber location information in a Radius Server (remote authentication server).

Please amend paragraph number [28] as shown below.

[28]   The method for transferring subscriber location information in a network communication system further comprises: replacing the destination MAC address in the ~~packet~~message to be sent by the network access device from its network-side port to the subscriber with the MAC address of the subscriber terminal, and then sending the ~~packet~~message to the subscriber.

In paragraph 29 of the translated application, please make the following change.

[29]   Said step of converting the accessed subscriber location information into a code in the same encoding format as the MAC address carried in the ~~packet~~message to be sent outwards by the subscriber comprises:

Please amend paragraph number [37] as shown below.

[37]   mapping the ~~physical~~ subscriber location information to the subscriber location information code through direct mapping; or

Please amend paragraph number [38] as shown below.

[38]   converging the ~~physical~~ subscriber location information to an intermediate variable ID, and then mapping the intermediate variable ID to the subscriber location information code.

Please add the following new paragraphs immediately after paragraph number [38].

In another aspect, the present invention provides a method for converting media access control (MAC) address, including the steps of:

a network access device generating a MAC address from the MAC address resource pool; and

replacing the source MAC address in a packet from a subscriber with the generated

MAC address.

The generated MAC address is unique.

In the method for converting MAC address, the step of generating a MAC address

from the MAC address resource pool further includes the step of: generating the MAC

address according to at least one of network access device ID in the network accessed by the

subscriber, slot number of the subscriber interface board in the network access device where

the subscriber accesses, and port number of the subscriber interface board where the

subscriber accesses.

Please amend paragraph number [39] as shown below.

[39]   It can be seen from the technical solution provided in the present invention

that the present invention achieves effective transmission of subscriber location information

in the network communication system by carrying the port information and slot information

of the network access device where the subscriber accesses as well as information of the

network access device in the source MAC address field of the subscriber packet~~message~~

transferred in the network and transferring the subscriber packet~~message~~ to the access

server. The method of the present invention is no longer restricted by the number of

permitted VLAN IDs in the network, and thereby improves feasibility of acquisition of

subscriber location information, providing a convenience for network operators to

implement relevant extended services in network communication systems.

Please amend paragraph number [40] as shown below.

[40]   The present invention is especially adapted to broadband network

communication systems, in which the broadband access devices can transfer location

information (e.g., access port where the subscriber accesses) to BRAS devices through

packets~~messages~~ transferred in the network, so that the BRAS can, when processing PPPoE

or other authentication protocols for the subscribers, process value-added services and

network security, including theftproofing of account number, account number binding

service, and physical tracing of hackers, etc. according to the subscriber location

information.

Please amend paragraph number [41] as shown below.

[41]   Fig.1 is a schematic diagram of network structure of a network

communication system;

Fig.2 is a flow diagram of an embodiment of the present invention;

Fig.3 is a schematic diagram of bearing subscriber location information in a

packet~~message~~ as described in the present invention;

Please amend paragraph number [45] as shown below.

[45]   configuring a correspondence between the subscriber location information

and the subscriber location information code in the network access device, so as to convert

the ~~physical~~ location information of the accessed subscriber into the corresponding

subscriber location information code according to the configured correspondence, and

transferring the same in the network communication system; in uplink direction, said

correspondence records the correspondence between the subscriber location information

(MAC address, port number, slot number of the subscriber terminal, etc.) and the subscriber

location information code; in downlink direction, said correspondence records the

correspondence between the subscriber location information code and the MAC address of

the subscriber terminal; said subscriber location information code is in the same format as

the content in a certain field of a subscriber packet~~message~~, e.g., the subscriber location

information code is in the same format as MAC address carried in a subscriber

packet~~message~~; said correspondence may be stored in a tabular form;

Please amend paragraph number [46] as shown below.

[46]   configuring a correspondence between the subscriber location information code and the subscriber location information in the access server or Radius Server (remote authentication server), so that the access server can determine the ~~physical~~ subscriber location according to the configured correspondence and the subscriber location information code carried in the packet~~message~~ when receiving the packet~~message~~; said correspondence may also be stored in a tabular form.

Please amend paragraph number [50] as shown below.

[50]   Step 203: replacing the content of a field in the same format as the code in the subscriber packet~~message~~ with the determined subscriber location information code, and transferring the resulted subscriber packet~~message~~ in the network, so that the access server that need obtain the subscriber location information can receive the subscriber packet~~message~~ and obtain the corresponding subscriber location information; for example, when said subscriber location information is in the same format as MAC address, it replaces the source MAC address in the source MAC address field in the subscriber packet~~message~~ with the determined subscriber location information code.

Please amend paragraph number [51] as shown below.

[51]   Step 204: when receiving the subscriber packet~~message~~ sent in step 203, the access server obtains the subscriber location information code from the corresponding field in the subscriber packet~~message~~.

Please amend paragraph number [52] as shown below.

[52]   Step 205: during local authentication, the access server searches in the correspondence table configured in it in step 200 according to the obtained subscriber location information code, so as to obtain the ~~physical~~ location information of the subscriber; during Radius authentication, said location information code is transferred, through an authentication ~~packet~~ message, to the Radius Server, which searches in the correspondence configured in it and thereby obtains the ~~physical~~ location information of the subscriber.

Please amend paragraph number [54] as shown below.

[54]   In addition, since the processing steps 200 - 205 are added in the network communication system, the destination MAC address in the ~~packet~~ message, that is received by the network access device and is to be sent to the subscriber terminal, is the subscriber location information code instead of the MAC address of the subscriber terminal; therefore, according to the present invention corresponding processing procedures have to be added in the network access device, so as to replace the destination MAC address in the ~~packet~~ message to be sent to the subscriber terminal with the MAC address of the subscriber terminal, and obtain the information including slot number and port number corresponding to said MAC address, and finally perform sending of the ~~packet~~ message; as shown in Fig.3, MAC1 is the physical MAC address information of the subscriber terminal, while MAC2 is the subscriber location information code; MAC1 is replaced with MAC2 when the access device sends the subscriber ~~packet~~ message; MAC2 is replaced with MAC1 when the access device sends the ~~packet~~ message to the subscriber terminal.

Please amend paragraph number [58] as shown below.

[58]   When accessing the broadband network via a subscriber access port in the subscriber interface board, a subscriber terminal sends an Ethernet ~~packet~~ message in Ethernet format to the broadband access device, with the source MAC address in the

packetmessage as MAC address of the subscriber terminal and the destination MAC address as MAC address of the next hop or the host.

Please amend paragraph number [59] as shown below.

[59]   The broadband access device creates a 48-bit subscriber location information code, according to the slot number and port numb of the subscriber interface board for the accessed subscriber, MAC address of the subscriber terminal and its own ID of the broadband access device, replaces the source MAC address in the subscriber packetmessage with said subscriber location information code, and sends the packetmessage to the broadband access server.

Please amend paragraph number [64] as shown below.

[64]   include, but are not limited to: one or more of MAC address of the subscriber terminal, priority, protocol encapsulation mode, subscriber type, and PVC (Permanent Virtual Connection) ID, etc., required to describe subscriber characteristics; said priority refers to a priority for packetmessage transmission; said protocol encapsulation mode may be PPPoE, etc; said subscriber type may be a personal subscriber or a subscriber in a network cafe, etc.;

Please amend paragraph number [67] as shown below.

[67]   When receiving the subscriber packetmessage sent from the broadband access device, the broadband access server obtains the subscriber location information code from the packetmessage and determines the physical-location information of the subscriber according to the code.

Please add the following new paragraphs immediately after paragraph number [67].

In fact, in the present invention, the subscriber location information is carried in the MAC address to implement the transmission of subscriber location information.

Therefore, the present invention further provides a method for converting MAC address, including the steps of:

a network access device generating a MAC address from the MAC address resource pool; and

replacing the source MAC address in a packet from a subscriber with the generated MAC address.

The generated MAC address is unique.

The step of generating a MAC address from the MAC address resource pool further includes the step of: generating the MAC address according to at least one of network access device ID in the network accessed by the subscriber, slot number of the subscriber interface board in the network access device where the subscriber accesses, and port number of the subscriber interface board where the subscriber accesses.